

## Exhibit 300: Capital Asset Plan and Business Case Summary

### Part I: Summary Information And Justification (All Capital Assets)

#### Section A: Overview

1. **Date of Submission:** 2011-02-25

2. **Agency:** 026

3. **Bureau:** 00

4. **Name of this Investment:** NASA Center for Climate Simulation (NCCS)

5. **Unique Project (Investment) Identifier (UPI):** 026-00-01-04-01-1502-00

6. **What kind of investment will this be in FY 2012?:** Operations and Maintenance

- Planning
- Full Acquisition
- Operations and Maintenance
- Mixed Life Cycle
- Multi-Agency Collaboration

7. **What was the first budget year this investment was submitted to OMB?** FY2003

8.

- a. **Provide a brief summary of the investment and justification, including a brief description of how this closes in part or in whole an identified agency performance gap, specific accomplishments expected by the budget year and the related benefit to the mission, and the primary beneficiary(ies) of the investment.**

Computational modeling & simulation are now equal partners to experiment & theory in achieving scientific & engineering progress. As a result, NCCS broadly supports NASA's Strategic Goals & leverages precious human resources - NASA's scientists & engineers - by reducing time to solution & enabling ever more complex simulations. NCCS further leverages investments by providing backup & continuity of operation to the ARC/NAS facility for high-priority missions. NCCS systems align with NASA EA. NCCS high performance computer systems, mass storage systems, & high performance networks serve ~600 users across 130 computational projects. As an ongoing operational data center, NCCS regularly refreshes & updates its suite of hardware, software, mass storage, & network infrastructure, to ensure that NCCS services continue to meet evolving needs of users & support their mission processes. In BY12, NCCS enables greater model complexity & fidelity; increased observing system & reanalysis data usage; improved interactive analysis & visualization capabilities; refreshed mass storage technology & archive performance; and execution & distribution of Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report climate simulations. NCCS assets include: 224 TF (20,992 cores) HEC compute host; 3.2 PB on-line disk; 17 PB mass storage data archive; 1.2 TF analysis/visualization cluster with COTS & custom software tools - including the Climate Data Analysis Toolkit; 128 CPU data portal with 200 TB on-line storage with enhanced data distribution capabilities; code development repository; specialized software integration & visualization support with enhanced display capabilities; multi-10Gbps-capable Science & Engineering Network; & a scientific visualization studio supporting specialized high-definition analysis & movie making capabilities. NCCS capitalized HEC investments through the reuse of ~14,000 archive tapes obsolesced at ARC/NAS facility with the introduction of their new storage system, thus saving NCCS ~\$1.6M. Specific BY10 ARRA-funded activities included: 45 TF (included above); installation of Earth System Grid (ESG) Data Node for IPCC data distribution; 15-panel hyperwall for scientific demonstrations; data management system development for accessing observing system data for climate model validation; assessment of emerging accelerator technologies for improved model performance; & desktop climate computing implementation for enhanced model sharing.

- b. **Provide any links to relevant websites that would be useful to gain additional information on the**

investment including links to GAO and IG reports.

| Title | Link |
|-------|------|
| NONE  |      |

9.

a. Provide the date of the Agency's Executive/Investment Committee approval of this investment.

2010-09-02

b. Provide the date of the most recent or planned approved project charter. 2010-04-20

10. Contact information?

a. Program/Project Manager Name: \*

Phone Number: \*

Email: \*

b. Business Function Owner Name (i.e. Executive Agent or Investment Owner): Tsengdar J. Lee

Phone Number: \*

Email: \*

11. What project management qualifications does the Project Manager have? (choose only one per FAC-P/PM or DAWIA): Project manager qualifications according to FAC-P/PM or DAWIA criteria is under review for this investment.

- Project manager has been validated according to FAC-P/PM or DAWIA criteria as qualified for this investment.
- Project manager qualifications according to FAC-P/PM or DAWIA criteria is under review for this investment.
- Project manager assigned to investment, but does not meet requirements according to FAC-P/PM or DAWIA criteria.
- Project manager assigned but qualification status review has not yet started.
- No project manager has yet been assigned to this investment.

## Section B: Summary of Funding (Budget Authority for Capital Assets)

1.

Table I.B.1: Summary of Funding  
(In millions of dollars)

(Estimates for BY+1 and beyond are for planning purposes only and do not represent budget decisions)

|   | PY-1<br>and<br>earlier | PY<br>2010 | CY<br>2011<br>(CY Continuing<br>Resolution) | BY<br>2012 | BY+1<br>2013 | BY+2<br>2014 | BY+3<br>2015 | BY+4<br>and<br>beyond | Total |
|---|------------------------|------------|---|------------|--------------|--------------|--------------|-----------------------|-------|
| Planning:   | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Acquisition:  | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Planning &<br>Acquisition<br>Government FTE<br>Costs                  | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Subtotal Planning &<br>Acquisition(DME):                              | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Operations &<br>Maintenance:  | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Disposition Costs<br>(optional):                                      | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Operations,<br>Maintenance,<br>Disposition<br>Government FTE<br>Costs | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Subtotal O&M and<br>Disposition Costs<br>(SS):                        | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| TOTAL FTE Costs   | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| TOTAL (not<br>including FTE<br>costs):                                | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| TOTAL (including<br>FTE costs):                                       | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |
| Number of FTE<br>represented by                                       | *                      | *          | *   | *          | *            | *            | *            | *                     | *     |

**Table I.B.1: Summary of Funding**  
**(In millions of dollars)**

(Estimates for BY+1 and beyond are for planning purposes only and do not represent budget decisions)

|        | PY-1<br>and<br>earlier | PY<br>2010 | CY<br>2011<br>(CY Continuing<br>Resolution) | BY<br>2012 | BY+1<br>2013 | BY+2<br>2014 | BY+3<br>2015 | BY+4<br>and<br>beyond | Total |
|--------|------------------------|------------|---|------------|--------------|--------------|--------------|-----------------------|-------|
| Costs: |                        |            |   |            |              |              |              |                       |       |

2. Insert the number of years covered in the column “PY-1 and earlier”: 9

3. Insert the number of years covered in the column “BY+4 and beyond”: \*

4. If the summary of funding has changed from the FY 2011 President’s Budget request, briefly explain those changes:

\*

## Section C: Acquisition/Contract Strategy (All Capital Assets)

1.

Table I.C.1 Contracts Table

| Contract Status | Contracting Agency ID | Procurement Instrument Identifier (PIID)                 | Indefinite Delivery Vehicle (IDV) Reference ID | Solicitation ID | Alternative financing | EVM Required | Ultimate Contract Value (M) | Type of Contract/Task Order (Pricing) | Is the contract a Performance Based Service Acquisition (PBSA)? | Effective date | Actual or expected End Date of Contract/Task Order | Extent Completed | Short description of acquisition   |
|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|--|
| Awarded         |                       | GSA#<br>GSC-TFMG-07-M084<br>; NASA Order #<br>NNG08HZ011 |  |                 | *                     | *            | \$113.1                     | Cost Plus Award Fee                   | Y   | 2007-12-05     | 2012-12-04   |                  | HPC services. GSFC took back admin of its hpc task order from GSA during FY09. In late September, the \$4.2M that was on the GSA task order contract was reverted back to NASA management. This accounts for the major portion of under-costing. |
| Awarded         | 8000                  | <a href="#">NNG09HP07D</a>                               | GS00T99ALD0203                                 |                 | *                     | *            | \$113.1                     | Cost Plus Award Fee                   | Y   | 2009-05-02     | 2011-12-05   | N                | High Performance Computing System Integration,   |

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|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|--|
|                 |                       |  |  |                 |                       |              |                             |                                       |   |                |  |                  | Administration, Operations and Support at NCCS   |
| Awarded         | 8000                  | <a href="#">NNG09HP11D</a>               | GS00T99ALD0203                                 |                 | *                     | *            | \$113.1                     | Firm Fixed Price                      | Y   | 2009-05-02     | 2011-12-05   | N                | The Contractor shall support TOOLS, TRAVEL, ODC's, AND CONTRACT OR ACCESS FEE in the following description for High Performance Computing System Integration, Administration, Operations and Support at the NASA Center for Computational Sciences (NCCS) as further described herein. |
| Awarded         | 8000                  | <a href="#">NNG06HN01D</a>               | GS00T99ALD020                                  |                 | *                     | *            | \$30.0                      | Cost Plus                             | X   | 2005-10-31     | 2011-04-30   | Y                | SUPPORT  |

Table I.C.1 Contracts Table

| Contract Status | Contracting Agency ID | Procurement Instrument Identifier (PIID) | Indefinite Delivery Vehicle (IDV) Reference ID | Solicitation ID | Alternative financing | EVM Required | Ultimate Contract Value (M) | Type of Contract/Task Order (Pricing) | Is the contract a Performance Based Service Acquisition (PBSA)? | Effective date | Actual or expected End Date of Contract/Task Order | Extent Completed | Short description of acquisition   |
|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|--|
|                 |                       |  | 7  |                 |                       |              |                             | Award Fee                             |   |                |  |                  | OF SYSTEM AND APPLICATION SOFTWARE FOR HIGH PERFORMANCE TECHNICAL COMPUTERS FOR THE SOFTWARE INTEGRATION OFFICE  |
| Awarded         |                       | <a href="#">NNG09DA02C</a>               |  |                 | *                     | *            | \$200.0                     | Cost Plus Award Fee                   | Y   | 2009-01-22     | 2014-04-27   | Y                | Program Analysis and Control (PAAC III) provides Planning and scheduling; Configuration Management ; Information Technology; Documentation/Library; General Business; and General Accounting services. |
| Awarded         |                       | <a href="#">NNG06HX04C</a>               |  |                 | *                     | *            | \$48.0                      | Cost Plus                             | Y   | 2006-01-01     | 2011-12-31   | Y                | support to   |

Table I.C.1 Contracts Table

| Contract Status | Contracting Agency ID | Procurement Instrument Identifier (PIID) | Indefinite Delivery Vehicle (IDV) Reference ID | Solicitation ID | Alternative financing | EVM Required | Ultimate Contract Value (M) | Type of Contract/Task Order (Pricing) | Is the contract a Performance Based Service Acquisition (PBSA)? | Effective date | Actual or expected End Date of Contract/Task Order | Extent Completed | Short description of acquisition  |
|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|---|
|                 |                       |  |  |                 |                       |              |                             | Award Fee                             |   |                |  |                  | gsfc's global modeling and assimilation office (gmao) for the development and use of models and assimilation systems. |

Awarded

[NNG06EB68C](#)

\*

\*

\$220.0

Cost Plus  
Award Fee

Y

2006-07-01

2011-06-30

Y

The purpose of this contract is to provide computer system management, including the operating system and application software, the development and use of scientific and engineering data analysis systems, and the engineering efforts that develop new technology for scientific instrumentation.



Table I.C.1 Contracts Table

| Contract Status | Contracting Agency ID | Procurement Instrument Identifier (PIID) | Indefinite Delivery Vehicle (IDV) Reference ID | Solicitation ID | Alternative financing | EVM Required | Ultimate Contract Value (M) | Type of Contract/Task Order (Pricing) | Is the contract a Performance Based Service Acquisition (PBSA)? | Effective date | Actual or expected End Date of Contract/Task Order | Extent Completed | Short description of acquisition   |
|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|--|
|                 |                       |  |  |                 |                       |              |                             |                                       |   |                |  |                  | on for Space and Earth Sciences research at the GSFC.  |
| Awarded         |                       | NCC5-494 (Grant)                         |  |                 | *                     | *            | \$129.0                     | Labor Hours                           | Y   | 2005-04-10     | 2011-05-10   |                  | HPC Program Management and Earth System Gid (ESG) Management   |
| Awarded         | 8000                  | <a href="#">NNG09HP17D</a>               | NNG09HP06Z                                     |                 | *                     | *            | \$1.7                       |                                       | Y   | 2009-10-01     | 2010-09-30   | Y                | The contractor shall provide engineering, tools, personnel and test equipment necessary to meet the following requirements : -Research real-time data dissemination methods and load balancing computationally |

Table I.C.1 Contracts Table

| Contract Status | Contracting Agency ID | Procurement Instrument Identifier (PIID) | Indefinite Delivery Vehicle (IDV) Reference ID | Solicitation ID | Alternative financing | EVM Required | Ultimate Contract Value (M) | Type of Contract/Task Order (Pricing) | Is the contract a Performance Based Service Acquisition (PBSA)? | Effective date | Actual or expected End Date of Contract/Task Order | Extent Completed | Short description of acquisition |
|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|----------------------------------|
|-----------------|-----------------------|--|--|-----------------|-----------------------|--------------|-----------------------------|---------------------------------------|---|----------------|--|------------------|----------------------------------|

architectures  
as can be  
applied to  
the IPOPP  
system.  
-Technical

2. If earned value is not required or will not be a contract requirement for any of the contracts or task orders above, explain why:

\*

3.

- a. Has an Acquisition Plan been developed? If yes, please answer the questions that follow \*
- b. Does the Acquisition Plan reflect the requirements of FAR Subpart 7.1 \*
- c. Was the Acquisition Plan approved in accordance with agency requirements \*
- d. If "yes," enter the date of approval? \*
- e. Is the acquisition plan consistent with your agency Strategic Sustainability Performance Plan? \*
- f. Does the acquisition plan meet the requirements of EOs 13423 and 13514? \*
- g. If an Acquisition Plan has not been developed, provide a brief explanation.

\*

## Part II: IT Capital Investments

### Section A: General

1.
  - a. Confirm that the IT Program/Project manager has the following competencies: configuration management, data management, information management, information resources strategy and planning, information systems/network security, IT architecture, IT performance assessment, infrastructure design, systems integration, systems life cycle, technology awareness, and capital planning and investment control. yes
  - b. If not, confirm that the PM has a development plan to achieve competencies either by direct experience or education.
  
2. Describe the progress of evaluating cloud computing alternatives for service delivery to support this investment. nccs provides a private science cloud platform as a service (paas), delivering data-intensive computing resources to nasa's science research community. nccs meets all criteria specified in nist's definition of cloud computing (v15, 10/7/09).
  
3. Provide the date of the most recent or planned Quality Assurance Plan 2009-12-15
  
4.
  - a. Provide the UPI of all other investments that have a significant dependency on the successful implementation of this investment.
  - b. If this investment is significantly dependent on the successful implementation of another investment(s), please provide the UPI(s).
  
5. An Alternatives Analysis must be conducted for all Major Investments with Planning and Acquisition (DME) activities and evaluate the costs and benefits of at least three alternatives and the status quo. The details of the analysis must be available to OMB upon request. Provide the date of the most recent or planned alternatives analysis for this investment. 2010-08-18
  
6. Risks must be actively managed throughout the lifecycle of the investment. The Risk Management Plan and risk register must be available to OMB upon request. Provide the date that the risk register was last updated. 2010-07-13

## Section B: Cost and Schedule Performance

Table II.B.1. Comparison of Actual Work Completed and Actual Costs to Current Approved Baseline:

| Description of Activity        | DME or SS | Agency EA Transition Plan Milestone Identifier | Planned Cost (\$M) | Actual Cost (\$M) | Planned Start Date | Actual Start Date | Planned Completion Date | Actual Completion Date | Planned Percent Complete | Actual Percent Complete |
|--------------------------------|-----------|--|--------------------|-------------------|--------------------|-------------------|-------------------------|------------------------|--------------------------|-------------------------|
| FY 2000 Operational Support    | SS        | *  | \$18.3             | \$18.3            | 1999-10-01         | 1999-10-01        | 2000-09-30              | 2000-09-30             | 100.00%                  | 100.00%                 |
| FY 2001 Operational Support    | SS        | *  | \$17.1             | \$17.1            | 2000-10-01         | 2000-10-01        | 2001-09-30              | 2001-09-30             | 100.00%                  | 100.00%                 |
| FY 2002 Operational Support    | SS        | *  | \$21.0             | \$21.0            | 2001-10-01         | 2001-10-01        | 2002-09-30              | 2002-09-30             | 100.00%                  | 100.00%                 |
| FY 2003 Operational Support    | SS        | *  | \$17.0             | \$17.0            | 2002-10-01         | 2002-10-01        | 2003-09-30              | 2003-09-30             | 100.00%                  | 100.00%                 |
| FY 2004 Operational Support    | SS        | *  | \$17.0             | \$17.0            | 2003-10-01         | 2003-10-01        | 2004-09-30              | 2004-09-30             | 100.00%                  | 100.00%                 |
| FY 2005 Operational Support    | SS        | *  | \$13.8             | \$21.4            | 2004-10-01         | 2004-10-01        | 2005-09-30              | 2005-09-30             | 100.00%                  | 100.00%                 |
| FY 2006 Operational Support    | SS        | *  | \$11.7             | \$11.9            | 2005-10-01         | 2005-10-01        | 2006-09-30              | 2006-09-30             | 100.00%                  | 100.00%                 |
| FY 2007 Operational Support    | SS        | *  | \$14.3             | \$9.4             | 2006-10-01         | 2006-10-01        | 2007-09-30              | 2007-09-30             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - RFP        | DME       | *  | \$0.1              | \$0.1             | 2005-10-01         | 2005-10-01        | 2005-12-01              | 2005-12-14             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Evaluation | DME       | *  | \$0.1              | \$0.1             | 2005-12-01         | 2005-12-14        | 2006-02-28              | 2006-03-24             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Award      | DME       | *  | \$0.0              | \$0.0             | 2006-02-28         | 2006-03-24        | 2006-03-31              | 2006-03-31             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Order -    | DME       | *  | \$2.2              | \$2.0             | 2006-03-31         | 2006-03-31        | 2006-03-31              | 2006-04-05             | 100.00%                  | 100.00%                 |

Table II.B.1. Comparison of Actual Work Completed and Actual Costs to Current Approved Baseline:

| Description of Activity                   | DME or SS | Agency EA Transition Plan Milestone Identifier | Planned Cost (\$M) | Actual Cost (\$M) | Planned Start Date | Actual Start Date | Planned Completion Date | Actual Completion Date | Planned Percent Complete | Actual Percent Complete |
|---|-----------|--|--------------------|-------------------|--------------------|-------------------|-------------------------|------------------------|--------------------------|-------------------------|
| Initial                                   |           |  |                    |                   |                    |                   |                         |                        |                          |                         |
| FY 06 HPC Cluster - Delivery - Initial    | DME       | *  | \$0.0              | \$0.0             | 2006-03-31         | 2006-04-05        | 2006-06-10              | 2006-06-30             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Acceptance - Initial  | DME       | *  | \$0.0              | \$0.2             | 2006-06-30         | 2006-06-30        | 2006-08-16              | 2006-12-31             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Order - Upgrade       | DME       | *  | \$3.8              | \$3.1             | 2006-05-31         | 2006-05-31        | 2006-05-31              | 2006-06-30             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Delivery - Upgrade    | DME       | *  | \$0.0              | \$0.0             | 2006-05-31         | 2006-06-30        | 2006-09-30              | 2006-11-27             | 100.00%                  | 100.00%                 |
| FY 06 HPC Cluster - Acceptance - Upgrade  | DME       | *  | \$0.0              | \$0.1             | 2006-09-30         | 2006-11-27        | 2006-11-30              | 2007-05-01             | 100.00%                  | 100.00%                 |
| FY 06 Data Architecture - Design          | DME       | *  | \$0.0              | \$0.0             | 2006-05-31         | 2006-05-31        | 2006-06-30              | 2006-12-01             | 100.00%                  | 100.00%                 |
| FY 06 Data Architecture - Order           | DME       | *  | \$2.2              | \$1.3             | 2006-06-30         | 2006-06-30        | 2006-07-14              | 2006-09-29             | 100.00%                  | 100.00%                 |
| FY 06 Data Architecture - Implementation  | DME       | *  | \$0.0              | \$0.0             | 2006-07-14         | 2006-09-29        | 2006-09-30              | 2007-02-28             | 100.00%                  | 100.00%                 |
| FY 06 Data Architecture - Acceptance      | DME       | *  | \$0.0              | \$0.0             | 2006-09-30         | 2007-01-31        | 2006-10-30              | 2007-02-28             | 100.00%                  | 100.00%                 |
| FY07 HPC Cluster - Order - 2nd Upgrade    | DME       | *  | \$2.5              | \$2.5             | 2007-04-27         | 2007-04-27        | 2007-04-27              | 2007-04-27             | 100.00%                  | 100.00%                 |
| FY07 HPC Cluster - Delivery - 2nd Upgrade | DME       | *  | \$0.0              | \$0.0             | 2007-04-27         | 2007-04-27        | 2007-07-24              | 2007-07-24             | 100.00%                  | 100.00%                 |

Table II.B.1. Comparison of Actual Work Completed and Actual Costs to Current Approved Baseline:

| Description of Activity   | DME or SS | Agency EA Transition Plan Milestone Identifier | Planned Cost (\$M) | Actual Cost (\$M) | Planned Start Date | Actual Start Date | Planned Completion Date | Actual Completion Date | Planned Percent Complete | Actual Percent Complete |
|---|-----------|--|--------------------|-------------------|--------------------|-------------------|-------------------------|------------------------|--------------------------|-------------------------|
| FY07 HPC Cluster - Acceptance - 2nd Upgrade   | DME       | *  | \$0.1              | \$0.0             | 2007-07-25         | 2007-07-24        | 2007-10-01              | 2007-10-11             | 100.00%                  | 100.00%                 |
| FY 2008 Operational Support   | SS        | *  | \$13.2             | \$12.9            | 2007-10-01         | 2007-10-01        | 2008-09-30              | 2008-09-30             | 100.00%                  | 100.00%                 |
| FY08 HPC Cluster - RFP - 3rd Upgrade  | DME       | *  | \$0.1              | \$0.1             | 2008-03-03         | 2008-03-03        | 2008-03-03              | 2008-03-03             | 100.00%                  | 100.00%                 |
| FY08 HPC Cluster - Order - 3rd Upgrade  | DME       | *  | \$3.1              | \$3.1             | 2008-04-30         | 2008-03-03        | 2008-05-30              | 2008-05-30             | 100.00%                  | 100.00%                 |
| FY08* HPC Cluster - Acceptance - 3rd Upgrade  | DME       | *  | \$0.3              | \$0.1             | 2008-08-16         | 2008-08-16        | 2009-01-22              | 2009-02-18             | 100.00%                  | 100.00%                 |
| FY08 HPC Cluster - Support  | DME       | *  | \$2.1              | \$2.1             | 2007-10-01         | 2007-10-01        | 2008-09-30              | 2008-09-30             | 100.00%                  | 100.00%                 |
| FY09 Operational Support  | SS        | *  | \$15.9             | \$13.6            | 2008-10-01         | 2008-10-01        | 2009-09-30              | 2009-09-30             | 100.00%                  | 100.00%                 |
| FY09 HPC Upgrade  | DME       | *  | \$4.9              | \$4.9             | 2008-10-01         | 2008-12-01        | 2009-09-30              | 2009-06-25             | 100.00%                  | 100.00%                 |
| FY10 Operational Support:<br>Includes 156 teraflop super computing upgrade, mass storage system replacement, and maintenance of the NCCS computing equipment. | SS        | *  | \$16.2             | \$15.8            | 2009-10-01         | 2009-10-01        | 2010-09-30              | 2010-09-30             | 100.00%                  | 100.00%                 |
| FY10 ARRA Support:  | SS        | *  | \$6.6              | \$6.5             | 2009-10-01         | 2009-10-01        | 2010-09-30              | 2010-09-30             | 100.00%                  | 100.00%                 |

Table II.B.1. Comparison of Actual Work Completed and Actual Costs to Current Approved Baseline:

| Description of Activity   | DME or SS | Agency EA Transition Plan Milestone Identifier | Planned Cost (\$M) | Actual Cost (\$M) | Planned Start Date | Actual Start Date | Planned Completion Date | Actual Completion Date | Planned Percent Complete | Actual Percent Complete |
|---|-----------|--|--------------------|-------------------|--------------------|-------------------|-------------------------|------------------------|--------------------------|-------------------------|
| Includes 46 teraflop supercomputing upgrade,  |           |  |                    |                   |                    |                   |                         |                        |                          |                         |
| FY11 Operational Support:<br>Includes 100 teraflop supercomputing upgrade, mass storage tape storage upgrades, and maintenance of the NCCS computing equipment. | SS        | *  | \$18.0             | \$6.7             | 2010-10-01         | 2010-10-01        | 2011-09-30              |                        | 36.95%                   | 36.95%                  |
| FY12 Operational Support:<br>Includes 87 teraflop supercomputing upgrade, mass storage tape storage upgrades, and maintenance of the NCCS computing equipment.  | SS        | *  | *                  | *                 | 2011-10-01         | *                 | 2012-09-30              | *                      | *                        | *                       |
| FY13 Operational Support  | SS        | *  | *                  | *                 | 2012-10-01         | *                 | 2013-09-30              | *                      | *                        | *                       |
| FY14 Operational Support  | SS        | *  | *                  | *                 | 2013-10-01         | *                 | 2014-09-30              | *                      | *                        | *                       |
| FY15 Operational Support  | SS        | *  | *                  | *                 | 2014-10-01         | *                 | 2015-09-30              | *                      | *                        | *                       |

Table II.B.1. Comparison of Actual Work Completed and Actual Costs to Current Approved Baseline:

| Description of Activity  | DME or SS | Agency EA Transition Plan Milestone Identifier | Planned Cost (\$M) | Actual Cost (\$M) | Planned Start Date | Actual Start Date | Planned Completion Date | Actual Completion Date | Planned Percent Complete | Actual Percent Complete |
|--------------------------|-----------|--|--------------------|-------------------|--------------------|-------------------|-------------------------|------------------------|--------------------------|-------------------------|
| FY16 Operational Support | SS        | *  | *                  | *                 | 2015-10-01         | *                 | 2016-09-30              | *                      | *                        | *                       |

**2. If the investment cost, schedule, or performance variances are not within 10 percent of the current baseline, provide a complete analysis of the reasons for the variances, the corrective actions to be taken, and the most likely estimate at completion.** NCCS was overly optimistic about schedules for milestones related to FY06 HPC Cluster & Data Architecture. Some procurement, vendor RFP response time, question & answer time, BAFO, negotiations, & delivery delays were not accounted for in schedule plan. Also, installation & acceptance issues, plus software problems in internal HPC Cluster network, were not anticipated. These issues are sometimes the norm with installation of state of art technology in high-performance computing environments.

**3. For mixed lifecycle or operations and maintenance investments an Operational Analysis must be performed annually. Operational analysis may identify the need to redesign or modify an asset by identifying previously undetected faults in design, construction, or installation/integration, highlighting whether actual operation and maintenance costs vary significantly from budgeted costs, or documenting that the asset is failing to meet program requirements. The details of the analysis must be available to OMB upon request. Insert the date of the most recent or planned operational analysis.**  
2010-08-10

**4. Did the Operational analysis cover all 4 areas of analysis: Customer Results, Strategic and Business Results, Financial Performance, and Innovation?**  
yes



Section C: Financial Management Systems

| Table II.C.1: Financial Management Systems |                |                          |            |
|--|----------------|--------------------------|------------|
| System(s) Name                             | System acronym | Type of Financial System | BY Funding |
| *  | *              | *                        | *          |

Section D: Multi-Agency Collaboration Oversight (For Multi-Agency Collaborations only)

| Table II.D.1. Customer Table: |                             |
|-------------------------------|-----------------------------|
| Customer Agency               | Joint exhibit approval date |
| NONE                          |                             |

| Table II.D.2. Shared Service Providers |                            |  |
|--|----------------------------|--|
| Shared Service Provider (Agency)       | Shared Service Asset Title | Shared Service Provider Exhibit 53 UPI (BY 2011) |
| *                                      | *                          | *  |

| Table II.D.3. For IT Investments, Partner Funding Strategies (\$millions): |                                  |                          |                           |                    |                          |                           |                    |
|--|----------------------------------|--------------------------|---------------------------|--------------------|--------------------------|---------------------------|--------------------|
| Partner Agency   | Partner exhibit 53 UPI (BY 2012) | CY Monetary Contribution | CY “In-Kind” Contribution | CY Fee-for-Service | BY Monetary Contribution | BY “In-Kind” Contribution | BY Fee-for-Service |
| NONE   |                                  |                          |                           |                    |                          |                           |                    |

| Table II.D.4. Legacy Systems Being Replaced |             |                               |
|---|-------------|-------------------------------|
| Name of the Legacy Investment of Systems    | Current UPI | Date of the System Retirement |
| *   | *           | *                             |

## Section E: Performance Information

Table I.E.1a. Performance Metric Attributes

| Measurement Area<br>(For IT Assets) | Measurement Grouping<br>(For IT Assets) | Measurement Indicator   | Reporting Frequency | Unit of Measure  | Performance Measure Direction | Baseline                     | Year Baseline Established for this measure<br>(Origination Date) |
|-------------------------------------|---|---|---------------------|------------------|-------------------------------|------------------------------|--|
| Technology                          | Load levels                             | Aggregate Compute Capacity (TFLOPS, peak); Compute capacity for execution of complex Earth and Space Science models, enabling scientific progress | annual              | teraflops (TF)   | Increase                      | 31.25 TF                     | 2006-09-01   |
|                                     |   |   | Fiscal Year         | Target           | Actual Results                | Target<br>"Met" or "Not Met" | Last Updated   |
|                                     |   |   | 2009                | 120.94 teraFLOPs | 111.70 teraFLOPs              | Not Met                      | 2011-02-25   |
|                                     |   |   | 2010                | 197.28 teraFLOPs | 320.98 teraFLOPs              | Met                          | 2011-02-25   |
|                                     |   |   | 2011                | 288.45 teraFLOPs |                               | Not Due                      | 2010-09-17   |
|                                     |   |   | 2012                | 207.00 teraFLOPs |                               | Not Due                      | 2010-09-17   |
| Processes and Activities            | Costs                                   | Cost per HPC cluster core hour  | annual              | dollars          | Decrease                      | \$0.14                       | 2010-09-01   |
|                                     |   |   | Fiscal Year         | Target           | Actual Results                | Target<br>"Met" or "Not Met" | Last Updated   |
|                                     |   |   | 2010                | \$0.15           | \$0.14                        | Met                          | 2011-02-25   |
|                                     |   |   | 2011                | \$0.15           |                               | Not Due                      | 2011-02-25   |
|                                     |   |   | 2012                | \$0.15           |                               | Not Due                      | 2011-02-25   |

| Customer Results             | Service Availability                                 | HPC cluster core hours availability to the NCCS scientific user community | annual      | hours              | Increase       | 100,000,000                  | 2010-09-01   |
|------------------------------|--|---|-------------|--------------------|----------------|------------------------------|--------------|
|                              |  |   | Fiscal Year | Target             | Actual Results | Target<br>"Met" or "Not Met" | Last Updated |
|                              |  |   | 2010        | 100,000,000        | 111,519,998    | Met                          | 2011-02-25   |
|                              |  |   | 2011        | 200,000,000        |                | Not Due                      | 2011-02-25   |
|                              |  |   | 2012        | 200,000,000        |                | Not Due                      | 2011-02-25   |
| Mission and Business Results | Scientific and Technological Research and Innovation | Number of research projects supported by NCCS systems                     | annual      | Number of projects | Increase       | 150                          | 2010-09-01   |
|                              |  |   | Fiscal Year | Target             | Actual Results | Target<br>"Met" or "Not Met" | Last Updated |
|                              |  |   | 2010        | 150                | 171            | Met                          | 2011-02-25   |
|                              |  |   | 2011        | 150                |                | Not Due                      | 2011-02-25   |
|                              |  |   | 2012        | 150                |                | Not Due                      | 2011-02-25   |

\* - Indicates data is redacted.